A TEN-YEAR REVIEW OF AMERICAN INVESTIGATIONS PERTAINING TO BLIND CHILDREN

KATHRYN E. MAXFIELD

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PERTAINING TO BLIND CHILDREN

By

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Nursery School for the Blind

Summit, New Jersey

March 15, 1937

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NOTE

As a member of the Committee on Research of the International Council for Exceptional Children a brief report was prepared on research studies which would be of particular interest to classroom teachers of the blind. This will appear in some publication of the International Council. However, since it was necessary to review a great deal of material which could not be brought within the limits set for that report, the advice of the Chairman of the Committee on Research was followed and the material was expanded into this more comprehensive survey. Even here, only those studies have been mentioned which seem to have constructive classroom value. This has meant the omission of a few well-publicized studies, as well as the omission of a few which are of considerable theoretical interest yet whose practical implications are not yet clear.

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Introduction

In 1928, Dr. R. S. French commented on the fact that most of the research studies which had been made up to that time in the interests of blind children were little more than "beginnings." (6) This is as true in 1937 as it was nine years ago. Although there have been a number of excellent investigations and a few experimental studies during the last few years which suggest the importance of further work along the same lines, few of them have been carried far enough so that their findings can be looked upon as conclusive. However, among these are to be found some which contain valuable suggestions for the classroom teacher as well as for the administrator.

The studies may be grouped under the following headings: 1. techniques and materials of instruction, 2. mental and educational tests, 3. psychological problems, 4. curriculum organization and administration, and 5. miscellaneous.

Techniques and Materials of Instruction

Arithmetic: In experimental work on techniques and materials of instruction the names of Merry and Holland stand high. To date, the most important published research on arithmetic is that done by Dr. Frieda Kiefer Merry when she was Supervisor of the Department of Special Studies, an experimental five-year project carried on jointly by the American Foundation for the Blind and Perkins Institution for the Blind at Perkins. Dr. Merry obtained information from a number of intelligent graduates of schools for the blind regarding what they thought should be taught in arithmetic courses. (32) She found a predilection for the teaching of more than minima essentials, although emphasis was placed by the graduates upon the thorough acquisition of the fundamental processes. Also, type slates were considered valuable aids to the pupil learning arithmetic even though it was felt that the bulk of instruction should be oral. However, there was no unanimity of opinion regarding which type slate should be used.

This study was followed by another on The Types of Errors Made in Fundamental Arithmetical Processes by Pupils in Six Schools for the Blind. (31) In this the errors made by blind pupils were compared with those made by the seeing children in Osburn's study of arithmetical difficulties. (35) Six residential schools for the blind cooperated on this study by administering an adaptation of the Wisconsin Inventory Tests to the pupils in their third, fourth, fifth, and sixth grades. It was found that on these tests the combinations containing zero accounted for more than 18% of the errors in the entire survey. The largest number of errors occurred on the short division problems. On the test as a whole, though, the scores of the pupils in the schools for the blind compared favorably with the standards for seeing children. If a recurring survey of this sort could be made, over a period of three or four years, there would be much more evidence than there is now as to whether certain types of errors do or do not occur characteristically among blind children. If certain errors did prove

to be characteristic of the blind investigations into their causes would be justified.

A similar survey was made of the problem-solving ability of pupils in six residential schools for the blind, in which it was found that the pupils compared favorably with the seeing, although the blind children were somewhat older for their grades than were those with sight. (27) The experiments on the relative merits of different type slates were summarized in one article by Merry. (28) The slates used were the T.V.L., the Brannan-Cubarithme, and the Taylor Slates. The results indicated a difference in favor of the Brannan-Cubarithme slate, although Dr. Merry was careful to note that statistically valid data could be obtained only through the accumulation of records gathered over several years since very few children would be available at any one time for the necessary paired-group procedure.

Reading: During the years from 1925 to 1928 Maxfield, under the auspices of the American Foundation for the Blind, investigated the mechanics of braille reading and methods of teaching reading to blind beginners. These studies have been summarized in The Blind Child and His Reading. (22) Today, there seems to be a general tendency to teach braille reading by the word method. In 1928, however, most blind children were introduced to braille by the tedious process of locating individual dots in individual letters, and by writing these dots on a braille slate. Maxfield's findings indicated that for the majority of blind children the word-and-phrase method seemed the most effective, even though there might be some who needed to learn their letters first, just as must a certain number of seeing children.

In the chapter on Mechanics of Braille Reading, the results of experimental work are summarized on such topics as pressure of the finger-tips on the braille, the best interlinear spacing, the angle at which the fingers should be held to the braille, and the use of one or both hands in reading.

At the University of Texas, Dr. B. F. Holland, in coöperation with graduate students, has conducted some interesting experiments on braille reading. One relates to the mechanics used by two "good" and two "poor" readers in each of the grades from III through XI, in reading braille silently. (16) In this study motion pictures were taken of the subjects' hands as they silently read specified material. The camera was operated mechanically so that an exposure was made every fifth of a second. The records thus obtained were superimposed, by means of a projecting device, upon the material read so that the positions of the fingers in each exposure could be located and marked upon the line of braille. This study not only supports some of Maxfield's work in braille mechanics but sets forth the differences between the reading habits of the good and the poor readers in a satisfyingly objective manner. For instance, the poor readers took longer to read each line and were less uniform in their reading than were the good readers, and they covered less material with their right hands. The good readers spent less time at the end than at the beginning of a line of braille, whereas the poor readers spent more of their time at the end.

In another experiment Holland used equally objective methods for testing the speed and pressure factors in reading. (15) The subjects were seventeen slow and fast readers in grades IV to X. The pupils were selected on the basis of the records they made on the previous experiment. The material used consisted

of seven lines of braille. Here, also, the results gave support to previous work. It was found that the general tendency was for fast readers to use less pressure while reading braille than did the slow readers; that there was a low but positive correlation between pressure and speed, the subjects using less pressure being the ones who achieved higher speed; that although there was variation in speed for all of the readers there was less for the fast ones; and that the poor readers exhibited a tendency to increase the amount of pressure as they progressed from the beginning toward the end of the selection.

One of the most interesting studies on reading mechanics was that of Dr. Merry regarding the effectiveness of teaching contractions to beginners. (29) Although definite conclusions could not be reached because of the small number of subjects available, nevertheless the results of the experiment indicated that blind children could learn contractions from the beginning without having their spelling affected adversely. More research is needed upon this topic, although the expense of embossing the necessary material makes it a difficult problem for one school to undertake.

A problem closely related to braille reading and upon which further work should be undertaken is that of the practicability of using embossed pictures in teaching young blind children. One study on this subject was made by Dr. Ralph V. Merry and his work was built upon by Dr. Frieda Kiefer Merry. (25) This is a most interesting topic and one which is raised frequently by people who are new in their contacts with blind children. Since the results of the experiments by the Merrys could not be conclusive, it is important that their work be repeated and further experiments initiated, the results being interpreted in terms of such factors as the number of years of visual experience of the subjects, the amount of perspective represented in the embossed drawings, the value of such drawings as diagrammatic representations of known objects for purposes of study, and the wisdom of teaching blind children to use and make embossed pictures.

All of these experiments on reading must fall short of adequate validity, as do those on arithmetic, until they have been repeated on many more children of known degrees of "educational blindness." This is said in spite of the fact that Dr. Holland's two experiments served to verify much of the preceding work by Maxfield and earlier European experimenters. If his objective methods could be used with more children and over a longer period of time, enough records would be available so that the results could be interpreted in terms of degree and type of blindness, length of previous visual experience, length of period during which the individual was blind, methods by which he had been taught to read, and so forth.

At the Arthur Sunshine Home and Nursery School for the Blind, a study is now in progress on the contents of the most widely used braille primers and first readers, with reference to their vocabulary load, their meaningfulness to beginning braille readers, and the prereading experiences which they assume. It is hoped that this study will be a guide to the preschool and kindergarten training of future first graders in schools for the blind, and will furnish suggestions to administrators and teachers who are arranging for the brailling of new material.

During the last few years the American Foundation for the Blind has been carrying on an important project which has not yet been reported upon in the form of a research study. The TalkingBook is already known to teachers of blind children throughout the country. Although it is a valuable adjunct to the reading program of any braille class, its educational usefulness will be increased when an inexpensive recording device is made available so that teachers can prepare their own Talking Book material from day to day.

Writing: Surprisingly few investigations have been made on methods of teaching braille writing. In a study by Merry on the relative values of the braille slate and the braille writer for beginners, the indications were that the use of the writer did not lead to a dislike for the braille slate on the part of the child as some teachers had feared might be the case. (30) Neither did the use of the writer seem to affect their spelling adversely.

The use of the braille slate calls for fine motor-manual coördinations such as are rarely expected of seeing first graders. Theoretically, therefore, the braille writer would be the better instrument to use in teaching beginners to write braille. However, writers are heavy and cumbersome, and the six keys are arranged for adult hands and not for the small fingers of little children. This is true of the newest writers as well as of the older ones used in the experiment. Because of the awkardness of the regular braille writer Dr. Merry tried out a little writer called the Minerva, imported from Germany, which was small, light, and inexpensive. Also, the keys were better adapted to little fingers. Its one drawback was that it failed to meet with approval from mechanical experts, however useful it might be in the primary classroom. Nevertheless, further work should be done with a small writer which could meet the needs of first graders even though it was not practicable for general use. Also, further experimentation should be done on the relative merits of the braille slate and the new braille writers.

Nature Study: A great deal of thorough experimental work should be done on the teaching of nature study to blind children, probably in the form of longitudinal studies. Experimentally speaking, little has been published on this subject as yet, although many empirical articles are available which are full of suggestions to the teacher. Dr. Merry reported one study in which she tested the relative value of two-dimensional and three-dimensional models. (26) During the course of the experiment stuffed specimens from the school museum were used. This study suggested the need for introducing nature work into the curriculum as early as possible; indicated superiority of three-dimensional models over those of two dimensions; and set forth the need for much care in the selection of models, such as stuffed roosters or monkeys; and showed the advisability of correlating nature study with the reading program.

Mental and Educational Tests

Mental Tests: For over a decade Dr. Samuel P. Hayes and his assistants have been working on an adaptation of the Terman-Binet Test until now it has reached a reliable degree of standardization. (10) Since the 1930 revision appeared Dr. Hayes has gathered 2,100 additional test results, including retests, and is using these data to increase further the validity of his adaptation.

In 1931, Miss Ruth Sargent adapted a portion of the Otis Classification Test so that there might be a group test of intelligence for use with the blind. (39) This test is not difficult to administer, is useful in situations where the teacher must become acquainted quickly with the ability of her class, and is probably sufficiently well standardized for this type of test.

At the Institute of Juvenile Research in Chicago, Dr. Andrew W. Brown is working on a scale of intelligence tests for use with the visually-handicapped. It has been revised three different times and has two forms. However, the norms are still tentative, especially at the lower and upper age ranges. It is quite different from the Standford-Binet Test and should prove valuable.

Educational Tests: In 1922, Hayes published the first manual of adapted standardized tests for the use of teachers of the blind. (9) Five years later Maxfield adapted the three reading examinations in the Stanford Achievement Test, Forms A and B, and obtained tentative norms on these and on the spelling test. (21) This pamphlet also contained tentative norms for pupils in schools for the blind on the Gray Oral Reading Check Tests, Sets I., II., III., and IV. Except for the fact that the material was brailled, the Gray Tests required no adaptation for use with blind children.

In 1932, Maxfield's tentative norms and time intervals for the Stanford Achievement Reading Tests were checked and made more accurate by Dr. F. F. Caldwell. (3)

At the present time a comprehensive standardization of the Stanford Achievement Test, Forms V and W, is being carried out at Perkins Institution for the Blind which will represent the fruits of past experience on tests of this sort. Although a published report has not yet appeared the test material for Forms V and W is now available and should be of great value to classroom teachers of blind children. There is another study of the Stanford Achievement Test now in progress at the New York Institute for the Education of the Blind which is analytical in character and which will probably be of considerable interest to teachers.

One other reading test has been found satisfactory, and that is the adaptation of the Monroe Standardized Reading Test made by Mrs. Margaret Owen Thomas in 1930. Mrs. Thomas gives tentative norms for the blind on Tests I. and II., Forms 1 and 2. (42)

One language test has been adapted and tentative norms established, although on a small number of subjects. This is the American Council Alpha Spanish Test adapted by B. F. Holland. ( ) Because of the fact that languages are taught at the high school level and because language tests can be adapted more easily than some other types of educational tests it is surprising that nothing has been published on the adaptation of tests for use with the blind in German and French. Surely, there is a place for such materials as diagnostic aids for the classroom teacher. Accurately standardized norms for the blind may not be necessary in these tests since students who have progressed far enough through school to be studying languages should be able to meet the norms established for the seeing, except possibly on tests whose scores depend upon the ability to do a certain amount of work within a limited amount of time.

In the field of music, Dr. Ralph B. Merry has made an adequate adaptation of the Seashore Test. (33) These tests, carefully used at the beginning of a child's musical studies, can save many hours of misdirected effort not only for the teacher but for children who prove to lack the fundamental abilities required for genuine musical achievement.

A few years ago, Miss Marion Kappes adapted the Seashore Test and the Kwalwasser Test on Music Information and Appreciation, but her adaptations have never been used extensively enough so that norms might be established. (17)

At the present time Dr. Holland has under way a study of the spelling ability of blind pupils in which he compares their achievements on spelling tests with those of a large number of seeing children.

It is known that teachers in various schools and classes for the blind throughout the country have adapted informally educational tests for use with their own groups. If their work could be pooled with that of other teachers who were interested in the same subjects, a group of useful tests might be available in all subjects and for all schools. Although there is a definite limit to the value of educational tests, educators of the blind have not yet used such tests enough so that they need worry about placing too much dependence upon them.

Psychological Problems

If a blind child is to become an acceptable member of the general social group he must compare favorably with the seeing not only in attractiveness of personality and in educational achievement but in general maturity of social behavior. He must be able and willing to care for himself as well as seeing children of corresponding physical and mental age, even though the acquisition of this degree of efficiency requires of him greater effort than it does of those who see.

The appearance of the Vineland Social Maturity Scale may prove a blessing to psychologists and educators interested in the development of the blind child, because it gives objective criteria of development in social maturity against which any child's growth may be checked, whether or not that child is physically handicapped.

Recently, Miss B. Elizabeth McKay has made an initial report on the beginning of a serial investigation regarding the applicability of this Scale to visually-handicapped children of preschool age. (24) The results seem to indicate it will be helpful as a means of checking their development in social maturity not only in relation to that of other blind children but in relation to that of seeing children of corresponding physical age.

At the Pennsylvania Institution for the Instruction of the Blind, Miss Ruth Sargent is using the Social Maturity Scale with visually-handicapped children in the upper grades. Undoubtedly a full report will appear on her study at a later date.

This work with the Social Maturity Scale has been reported under the heading of Psychological Problems rather than under Mental Tests because of the fact that the interest in its use lies chiefly in the field of learning. Especially those who are interested in the young blind want to find out whether it is possible for those who have not had the usual developmental experiences of the average seeing child to make up for lost time when given special training. The Scale as it will be used, therefore, will be a method of checking achievement in learning as well as of checking the actual degree of social maturity at any given date.

To a blind person the ability to use language effectively is even more important as a social asset than it is to a seeing person. Not only should he be able to express himself clearly through good enunciation and through the accurate use of a wide vocabulary, but he needs to know how to use language for the expression of his personality. Stinchfield's valuable survey of the speech defects of pupils in schools for the blind was followed by Fladeland's study of the psychological effects of blindness in relation to speech defects. (41) (5) There is no doubt that a high percentage of speech defects is to be found among pupils in schools for the blind, and that some of these are caused by emotional conflicts occurring either directly or indirectly as the result of blindness. It is probable that some of the speech defects among the visually-handicapped in schools for the blind are due to the fact that these schools contain many pupils who come from homes where foreign languages are spoken. Yet at least part of the oral inactivity to be found among these pupils seems to be due to the fact that blind children cannot learn correct speech habits through visual imitation.

For some reason blind children, taken as a group, do not learn to talk as easily as do seeing children, and often give the impression of being pedantic in their use of words as they grow older. It seems important to get at the basis of some of these problems. Recently a study was completed by Maxfield in which a method was established for a longitudinal study on the language of visually-handicapped children between the years of approximately three and seven. (23) Since only eight totally blind children were used in this preliminary investigation no definite conclusions can be drawn, yet a few interesting results were obtained. For instance, it was found that none of these children expressed their fears and timidities in their language, even when it was obvious to the observers that fear and uncertainty were present. Yet, language which was charged with emotion and feeling proved to be a definite characteristic of these particular children. Another interesting point was the frequency with which these eight children called to the adults who were in their vicinity. It seems likely that they made use of naming both adults and children, during their free play time, first and foremost for the sake of spatial orientation and secondly for the purpose of obtaining a feeling of security in space. This study is to be continued and others initiated at the preschool level.

At the New York Institute for the Education of the Blind there is in prospect a diagnostic study of the basic vocabulary needs of pupils in a school for the blind. Whether this study is to take an educational or psychological trend is not known, yet it cannot but have psychological interest.

Dr. Holland has reported recently on the responses of blind, deaf, and normal children to the Otis Classification Test, Part II., Form A. (14) Although slight differences in methods of administration were necessary for the three groups of children these alone could not account for the disparities in the results. Holland made it clear that he did not look upon the scores as adequately measuring the intelligence of the groups tested. He felt that the chief differences between the physically normal and the blind and the deaf were due to the language handicap of the deaf. The scores for the blind were not markedly different from those for the seeing, as were the scores for the deaf children. A correlation of +.85 was obtained between the scores of the physically normal and those of the blind, whereas the correlation between those of the physically normal and the deaf was +.20. That between the blind and the deaf was +.43. One interesting point developed when it was found that the blind children taking the

test were able to react better than the physically normal to relatively long questions. It would be helpful if Holland's experiment could be repeated in some other part of the country, possibly in a dual school.

In 1924 a study was published by Pechstein on the factors influencing the school success of the blind. (36) Ten years later Hayes studied the data which he had been gathering on the responses to tests by blind children and compared his results with those of Pechstein. (8) Both writers found that mental sex differences among blind school children are insignificant. They both thought that the children who had just a little vision did the poorest work, although Hayes made it clear that he did not have sufficient data to speak conclusively. Regarding the influence of age at incidence of blindness, Pechstein found that early incidence correlated with low school success. Hayes, however, did not find the congenitally blind inferior in their results on his tests. In fact, there were individual cases of definite superiority among them. With regard to age at entrance into school Pechstein had some evidence that admission to school before the age of seven made no great difference in school success. Nevertheless, the teachers in his school disagreed with him and their position was supported by the findings of Hayes. Since this study deals with topics which are frequent sources of debate among educators of the blind, it would be worthwhile for someone to approach them through the use of other techniques.

A short time ago Hayes summarized the work done on the memory of the blind. (11) Soon a monograph by him is to appear which will review not only his own work on memory but that of other investigators.

Reference has already been made, in the section on Techniques and Materials of Instruction, to the study of embossed pictures by Dr. Ralph V. Merry and Dr. Frieda Kiefer Merry. (25) These studies have considerable psychological importance from the point of view of the value to the blind of plane surface schemata. There is much to be done in this field still and it is to be hoped that someone undertakes the task.

Those readers who are interested in the subject of synesthesia will want to turn to the studies by Wheeler and Cutsforth. (43) However, this is a subject about which more should be known before a safe attempt can be made to fit it into educational practice. This is especially true where congenitally blind children are concerned since whatever synesthesia they may possess will not be visual in character, the type about which most is known.

In 1926 a study was published by Koch and Ufkess on the comparative learning abilities of blind and seeing subjects in a stylus maze. (19) Nineteen pupils of the Texas School for the Blind, among whom were found many degrees of visual defect, were compared with one hundred seeing students of like age and intelligence.

Three years later Knotts and Miles carried out an experiment on the comparative maze learning abilities of blind and seeing children on the stylus-maze and the high-relief maze. (18) Forty blind children and forty seeing children blindfolded were the subjects. The two groups were matched according to age, sex, and intelligence. The experimenters found that the blind made fewer errors than the seeing on the stylus-maze and more errors on the finger, or high-relief, maze. Although an entirely consistent relationship between degree of

blindness and maze-learning ability is not shown by the mean number of trials, the median does show that the totally blind were likely to be less successful than the partially blind, and that the blind who had once seen were likely to be better than either the blind who had never seen or the partially blind. It was found that for the blind the verbal method of learning was superior.

Knotts and Miles were in agreement with Koch and Ufkess in finding that: 1. the extent of past visual experience affected the maze-learning ability, that is, when the subjects are considered as a group those who had had visual experience were more successful than those who had been blind from birth; 2. for both the blind and the seeing the degree of intelligence and method of attack played a definite part in success; 3. the most conspicuously poor maze-learners were found among the blind rather than among the seeing subjects.

They disagreed with Koch and Ufkess in considering the blind as inferior to the seeing in maze-learning ability because of the fact that when medians were used rather than averages, the blind as a group did as well as the seeing. However, this might not hold true for the totally and congenitally blind. They comment upon the reasonableness of supposing that emotional attitudes might exist among the blind which would be unfavorable toward the performance of novel tasks. Their group of blind subjects contained individuals who were more successful than any of the seeing subjects. It may be that only these few had sufficient motivation to give the necessary attention.

In 1933 Cutsforth reported on an interesting experiment pertaining to the relationship between tactual and visual perception in the seeing. (4) His problem was to find out whether the sensory field can be divided into discrete modalities. That is, could a subject working at a task which seemd to be primarily tactual eliminate the influence of other modalities such as visual, auditory, and so forth. Cutsforth had ten trained observers and one hundred twenty untrained ones. Although this work was done on university students and faculty members, its implications are of interest to teachers of blind children. The subjects reproduced tactually-kinesthetically what they had perceived visually, and vice versa. On different trials the methods of perception and response were varied, but always in the same two modalities. Cutsforth drew a number of conclusions, the final one being that, "From the results of this experiment it is necessary to conclude that the tactual field does not function, in seeing individuals, separately from the visual. The two modalities are not, and cannot, be distinct for the purposes of perception. It is an error to speak of a pure tactual or tactual-motor perception."

Two studies are in prospect which enter an important field in the psychology of the blind. One, by Dr. B. F. Holland and Miss Pauline Myler on the character traits of blind pupils, will give the results on the Allport Rating Scale of the pupils at the Texas School for the Blind. Correlations are being obtained between twenty traits of this Scale and motor ability. The other will emanate from the New York Institute for the Education of the Blind and will consist of a diagnosis of social and civic attitudes of blind school children, including their attitude toward their own handicap.

In 1930 Dr. Anita Muhl made a clinical study of one hundred and five blind pupils in a school for the blind which might well be followed by similar studies elsewhere. (34) The pupils were given neurological, psychometric, and

psychological examinations. The Hayes-Binet I.Q.'s of the group ranged from forty-three to one hundred and sixty-one. In spite of the fact that 24% of the students belonged to the superior group, 89% of the entire group failed the vocabulary test. In the group as a whole there was a marked lack of motor coördination. That for the upper extremities was just fair but that for the lower extremities was very poor. Only two of the one hundred and five passed entirely satisfactory neurological examinations. As to the personality problems, it was found that the students showed, "the marked suggestibility, the lack of initiative (due to emotional blocking), the tendency to get discouraged, and the sensitiveness which do a great deal of damage in that particular combination." All of these can be reduced or eliminated through proper training. True as that conclusion undoubtedly is, we are still faced with the problem of learning just what the proper training may be.

Curriculum Construction and Administration

During recent years there have been a few surveys that should be of special interest to administrators of schools and classes for the blind. In 1933 a doctor's thesis was published by Margaret E. Martin on practices and procedures in secondary schools for the blind in this country. (20) Her aims were "to discover and to compare present tendencies in the conduct of secondary education in schools for the blind in the United States", during the ten-year period of 1921-1931, giving special attention to organization, administration, curricula, and methods. Her primary sources were the reports and bulletins of schools for the blind, the United States Office of Education, the American Foundation for the Blind, and The Outlook for the Blind. She supplemented the information from these sources by correspondence with school officials and by the use of questionnaires. Although the value of her contribution would have been enhanced if she had been able to visit a few schools for the blind and to have stayed long enough to correct from personal observation the somewhat astigmatic point of view which is bound to appear in written reports, and although some reference to the articles appearing in The Teachers Forum for Instructors of Blind Children would have been helpful, nevertheless her conclusions should be of interest to supervisors and superintendents. Following, are samples of her conclusions:

> The problem of locating children in the various states has not been solved.
> The students are about equally divided between the totally blind and the partially seeing.
> There is no uniformity as to examinations, units and credits, certification, schools accredited to the university, and auxiliary school agencies.

Martin comments on the lack of information regarding the nature of blind children and the manner in which they differ from the seeing. She makes numerous recommendations, with most of which everyone in work for the blind would agree. One of them is that a definite guidance program should be developed in every school.

This need for a better understanding of vocational guidance and training for the blind has been felt by a number of educators and has recently been given some study of a survey character. Mr. W. G. Scarberry of the Ohio School for the Blind investigated the vocational courses given in a number of schools for the blind in this country. (40) He came to the conclusion that although some

of the vocational courses which have been given from time immemorial should be revised or possibly eliminated, nevertheless, other severely criticized courses should be continued until the critics have something better to offer in their place. Other recommendations are that an annual report be made, on guidance and courses, by each school to the secretary of the American Association of Instructors of the Blind so that this organization might act as a clearing house; that a complete survey be made in each State of the economic condition of the adult blind; that vocational teachers make a complete study of existing vocational courses and, using their findings and those of this survey, outline and redirect the emphasis in this phase of the work; and that adequate courses of study be brailled in whatever courses the need exists.

Dr. Louise Wilber has been interested in vocational counselling also, as shown in her doctor's thesis. (44) This interest grew out of her own experience as a graduate of a school for the blind and out of that of her classmates. In one place Wilber quoted extensively from a valuable monograph on, What Can the Blind Do?, prepared by Miss Ruth Sargent some years ago. (38) This was an analysis of what was actually being done by the graduates of the Pennsylvania Institution for the Instruction of the Blind. It discussed the graduates from the point of view of their occupations, without reference to degree of vision but with reference to sex, and with regard to their economic status.

Wilber herself worked with fifty selected children at the California School for the Blind who ranged from the 6th grade to graduate work and who were from thirteen to twenty-one years of age. On the basis of her results with this selected group and on the basis of suggestions from historical data she suggested a program of vocational guidance for use in schools for the visually handicapped. She urged the need for frequent conferences between the older high school pupils and the vocational counselor. In speaking of a pupil's choice of occupation she says, "The determination of the occupation to be followed by the pupil will depend first upon his own inclination. Other factors influencing the selection of a suitable vocation are: Innate ability, determination to succeed, ability to make social contacts, home environment, financial backing, possible business connections through home and otherwise, as well as many other factors."

A study of quite another sort is Andrews' investigation into the educational status of the blind mentally retarded in schools for the blind in the United States' (1) He investigated, by the questionnaire method and by personal study of the records of his own school, the possible relationships between the causes of blindness and mentality, and the reactions of educators to the problem as it now exists and to its future solution. Some caution is necessary in reading this study because of the fact that although all children with I.Q.'s under 90 have been included in the study, nevertheless in the historical section and elsewhere the impression is given that only strictly feebleminded children are being considered.

The educators answering the questionnaire realized that this group needed a special teacher and a special curriculum, although very few of the schools made such provisions. There seemed to be a difference of opinion as to what actually constituted a blind feebleminded child. Some felt that definitely feebleminded blind children should be housed in an institution for the feebleminded, others felt that the educable blind mentally-retarded should be educated in a separate institution which would care only for this particular group, and

others thought that those who were educable should be trained in schools for the blind.

In 1933 a one-year course of study in general science for use in schools for the blind was published and immediately attracted considerable attention. (7) It embodied the results of a two-year program of study and work by a committee appointed by the American Association of Instructors of the Blind and by six coöperating schools for the blind. This General Science Course is the result of one of the best coöperative service studies which has been attempted in recent years by schools for the blind. It would be highly desirable to have other courses worked out by the same method.

Among the general recommendations of the Committee are the following:

1. It is desirable to have the course in General Science given in the ninth grade.
2. The teaching program should include: participation by pupils in laboratory experiments and demonstrations; construction of models; reading of references; field trips; class discussions; reports of individual investigations; and a range of information and achievement tests.
3. It is desirable that a simple record of experiments and class demonstrations be kept in braille by each pupil.

A few schools have under way service studies relating to curriculum building and curriculum content to which both the teaching and the administrative staff are giving a great deal of thought. Among these are the Virginia School for the Deaf and Blind, Blind Department, the Ohio School for the Blind, the New York Institute for the Education of the Blind, and Perkins Institution for the Blind.

Miscellaneous Contributions

Two recent articles on research work in schools for the blind are well worth reading. The first, by Dr. Samuel P. Hayes, reports the growth of research work in this country from its beginning twenty years ago to the present time. (12) The other, by Dr. Clarence R. Athearn, of the New York Institute for the Education of the Blind, looks at the work of the last few years from the point of view of a person new to work for the blind who wants to base his own work upon a proper understanding of the field as it now exists. (2)

Although some of the studies covered in the preceding pages have included pupils from braille classes in the public schools it has been possible to find only one report which related definitely to the special problems confronting braille class teachers. This is a service study made by Miss Pauline V. Powers on the oral language errors of the pupils in her braille class. (37) Considering the difficulties under which she worked Miss Powers has succeeded rather well in making constructive suggestions. Her pupils varied widely in age, in mental ability, and in grade placement. Some of them came from bilingual homes and some did not. Through the use of the O'Rourke Achievement Tests she compared the achievement of her pupils with those of the seeing boys and girls in whose classes they recited. She also obtained the judgment of the regular class teachers.

This is a service study, and does not contain experimentally conclusive

results. However, it should be of interest to other braille class teachers to know that Miss Powers found a rapid vocabulary growth in the braille pupils who were taking Latin and that although the use of a foreign language in the home seemed to retard development in the use of English, the learning of another language at school seemed to help it. Miss Powers felt that her experiment as a whole showed "a rather consistent growth in error-consciousness and in the application of principles learned, indicating that continued remedial work brought about quite satisfactory results."

Conclusions

The last ten years have shown a growing realization of the need for a better understanding of the educational and psychological problems which blind pupils must encounter. Studies and investigations have been made on many topics but until they have been repeated or extended they cannot have sufficient validity to be of great value to classroom teachers. And it is the classroom teacher who should be the ultimate consumer of the results of such studies.

It is seldom that enough subjects can be found for any one cross-sectional experiment to give it scientific validity. Even among the available subjects there is too much variability; that is, too many degrees of mentality, too many degrees of vision, and too wide a range of previous experiences.

At the present time the great needs in the research field pertaining to blind children are for the repetition and continuation of investigations already made, for the testing of present results by different methods, and for the development of a few longitudinal studies on selected blind children covering the years from babyhood through the first two or three grades.

Longitudinal studies are especially important for the first few years of life, since a better knowledge of blind babies and preschool children might easily avert many of the educational and personality problems to be found among older blind children and even among blind adults.

We need to know more about the stimuli which will arouse the interest of blind babies in the world about them, and which will develop their use of language at more nearly the normal age. We need to know what experiential background they should have before entering school. Also, we should know more about such scientific problems as sensory reactions, facilitation of one sense by another, and the possibility of training the obstacle sense.

There are good reasons why almost no research work has been attempted with blind children under school age. It is an unusually difficult field because of the lack of previous work as a basis for further investigations, because of the small number of subjects, the geographical distance over which they are spread, and the range of characteristics to be found even in this small group of subjects. Then, too, until recently there has been the feeling that a blind child learned to walk and talk "instinctively", like seeing children. Whatever seeing youngsters may achieve, through imitation if not through instinct, blind babies rarely do these things without encouragement and guidance. Often, the unfortunate mannerisms and postures with which so many blind people go through life might be avoided if more were known about the proper care and training of the preschool blind child. It seems reasonable to assumre that society would be saved some financial burdens and blind people themselves made happier if more

knowledge on our part of the needs of the small blind child could forestall the development of unfortunate characteristics.

At the primary level further experiments, as well as further service investigations, need to be carried out in the interest of greater validity for the work already done. For instance, more should be known regarding the basic arithmetical errors made by blind students, the proper use and nature of type slates, and the amount and kind of arithmetic and higher mathematics which should be taught in schools and classes for the blind. With regard to reading, many points relating to the mechanics of braille reading could be settled once and for all if careful experimentation could be carried out with a large enough group of subjects. For instance, such matters as the pressure of the finger on the braille, the use of one or both hands in reading, and the use of the word or alphabet method in teaching beginning reading might be settled with sufficient definiteness without years of experimentation. If the work already done, especially Holland's, could be repeated or validated through further experiments on more subjects and in other schools, it would be reasonable to assume that the results would take their place among the established facts. Other matters such as the teaching of contractions from the beginning, or the value of embossed illustrations will call for more extensive experimentation.

A procedure should be established for a study of the vocabulary load of each primer and reader which is brailled. More work is needed on the use of braille writers in teaching beginning braille writing and it seems likely that a study of the correlation between the learning of writing and reading would be advisable. Experimentally speaking, the whole field of nature study has hardly been touched. Since this field has so much to offer blind children it is a most important field for study.

Although it would be desirable to have other types of mental tests evolved or adapted for use with blind children, especially performance tests, the more urgent need at present seems to be for educational tests. It is not that many educational tests need to be entirely standardized for each subject in the school curriculum. Rather, it is highly desirable that all the teachers throughout the country who have adapted tests for use in their particular schools shall get together and pool the results of their work. In this way it might be possible, without too much expense and time, to make available many tests which could be used with blind pupils throughout the country.

There are a number of psychological problems calling for thoughtful and scientific investigation. For instance, at all age-levels the elimination or avoidance of tics and mannerisms is fundamentally important. Yet, because of the difficulty in finding substitute interests for blind children, the elimination of these unfortunate characteristics presents a serious problem. It is bad enough at the preschool level, since it is so hard to find other interests for the children, but by the time a child has clung to his mannerisms until he is sixteen or seventeen years of age they have become so much a part of him that their eradication seems almost hopeless. Yet it is these very mannerisms which may prevent him from obtaining a good position or from fitting into a happy social life. Other psychological matters such as the elimination of fears, the development of adequate language, the development of proper social and civic attitudes, the inherent possibilities of the sense of touch, and the growth in social maturity of blind children as compared with those who see, all need strictly scientific attention over a long period of time.

Further work needs to be done on curriculum construction in order that the inherent needs of blind pupils may be given due attention at the same time that they are being prepared to take their place in a world of the seeing. Especially is further work needed on prevocational courses and vocational guidance.

With the developing interest in research which is appearing in American schools for the blind it seems as though valuable contributions might be made to the science and art of education through coöperation among the centers of research and through the pooling of experience of teachers and superintendents of the blind throughout the country.

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